```
!pip install pgmpy
import numpy as np
import pandas as pd
import csv
from pgmpy.estimators import MaximumLikelihoodEstimator
from pgmpy.models import BayesianNetwork
from pgmpy.inference import VariableElimination

heartDisease = pd.read_csv('/content/drive/MyDrive/heart.csv')
heartDisease = heartDisease.replace('?',np.nan)

print('Sample instances from the dataset are given below')
print(heartDisease.head())
```

Sample instances from the dataset are given below

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal	target
0	52	1	0	125	212	0	1	168	0	1.0	2	2	3	0
1	53	1	0	140	203	1	0	155	1	3.1	0	0	3	0
2	70	1	0	145	174	0	1	125	1	2.6	0	0	3	0
3	61	1	0	148	203	0	1	161	0	0.0	2	1	3	0
4	62	0	0	138	294	1	1	106	0	1.9	1	3	2	0

```
print('\n Attributes and datatypes')
print(heartDisease.dtypes)
```

Attributes and datatypes

```
age          int64
sex          int64
cp           int64
trestbps     int64
chol         int64
```

```
fbs          int64
restecg      int64
thalach      int64
exang        int64
oldpeak    float64
slope        int64
ca           int64
thal         int64
target       int64
dtype: object
```

```
model=
BayesianNetwork([('age','target'),('sex','target'),('exang','target'),('cp','target'),('target','restecg'),('target','chol')])
```

```
print('\nLearning CPD using Maximum likelihood estimators')
model.fit(heartDisease,estimator=MaximumLikelihoodEstimator)
```

```
Learning CPD using Maximum likelihood estimators
```

```
print('\n Inferencing with Bayesian Network:')
HeartDiseasetest_infer = VariableElimination(model)
```

```
 Inferencing with Bayesian Network:
```

```
print('\n 1. Probability of HeartDisease given evidence= restecg')
q1=HeartDiseasetest_infer.query(variables=['target'],evidence={'restecg':1})
print(q1)
```

```
 1. Probability of HeartDisease given evidence= restecg
+-----------+---------------+
| target    |   phi(target) |
+===========+===============+
| target(0) |        0.4354 |
```

```
+-----------+---------------+
| target(1) |        0.5646 |
+-----------+---------------+
```

```
print('\n 2. Probability of HeartDisease given evidence= cp ')
q2=HeartDiseasetest_infer.query(variables=['target'],evidence={'cp':2})
print(q2)
```

```
 2. Probability of HeartDisease given evidence= cp
+-----------+---------------+
| target    |   phi(target) |
+===========+===============+
| target(0) |        0.3832 |
+-----------+---------------+
| target(1) |        0.6168 |
+-----------+---------------+
```

In [ ]: